

# ENDOCRINE (*GLAND*) SYSTEM

## What is a hormone?

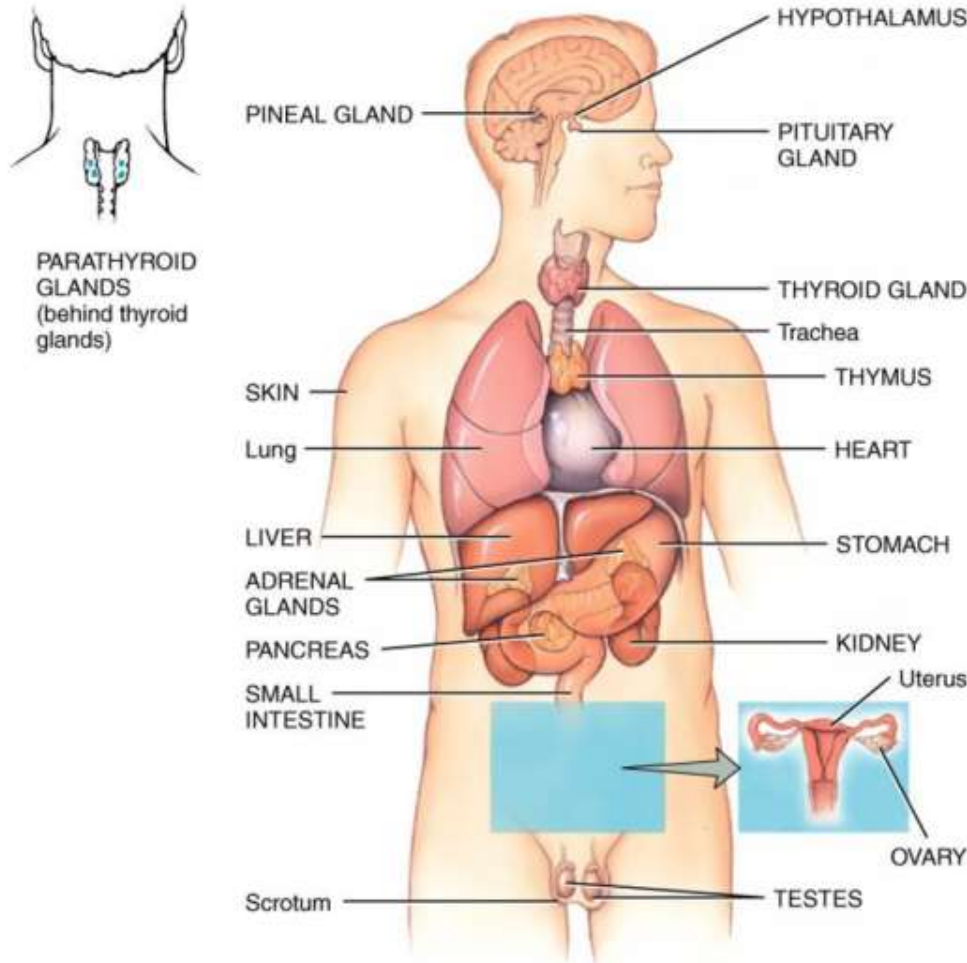


- **Hormones** are **chemical messengers** used in the body by the **endocrine system**.
- They co-ordinate our organs.
- **Hormones** are produced by **glands**.

- The EndoCrine System includes many glands.
- **Endo** = sending hormones **inside** blood to where they are needed. (**Exo**Crine = sends enzymes **outside** blood, through tubes.)
- Hormones are chemical (protein) messengers.
- Different ones cause different reactions across different body parts.
- They all act together, as an integrated unit.

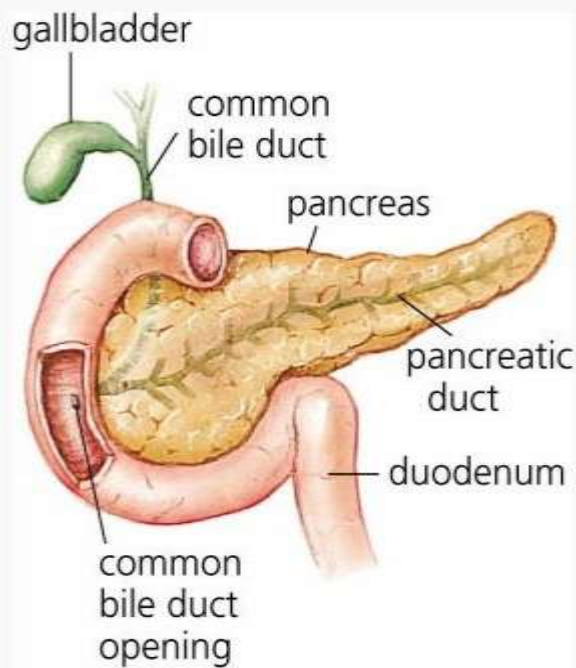
# The Endocrine System

## General Functions of Hormones

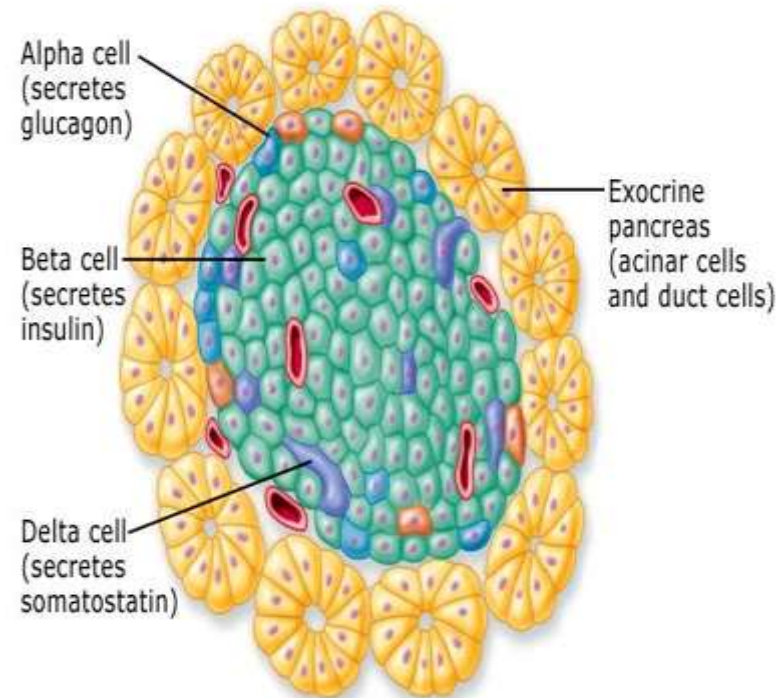


- Help regulate:
  - extracellular fluid
  - metabolism
  - biological clock
  - contraction of cardiac & smooth muscle
  - glandular secretion
  - some immune functions
- Growth & development
- Reproduction

<u>GLAND</u>	<u>POSITION</u>	<u>HORMONES</u>	<u>FUNCTION</u>
<u>Anterior</u> PITUITARY	Base of Brain	Human Growth H. Thyroid Stimulating Follicle Stimulating Luteinising H. ProLactin	Body growth Stimulates Thyroid Starts Ova & Sperm For Corpus Luteum Making Milk (Baby)
<u>Posterior</u> PITUITARY	Base of Brain	<u>Stores</u> AntiDiuretic	Keeps water: kidney
HYPO-THALAMUS	Base of Brain	<u>Makes</u> AntiDiuretic OxyTocin	Keeps water: kidney Contracts Uterus
THYROID	Throat (Trachea)	Thyroxin	Rate of Metabolism
PANCREAS	Small Intestine	Insulin (Beta Cells) Glucagon (Alpha)	Sugar from blood Puts sugar in



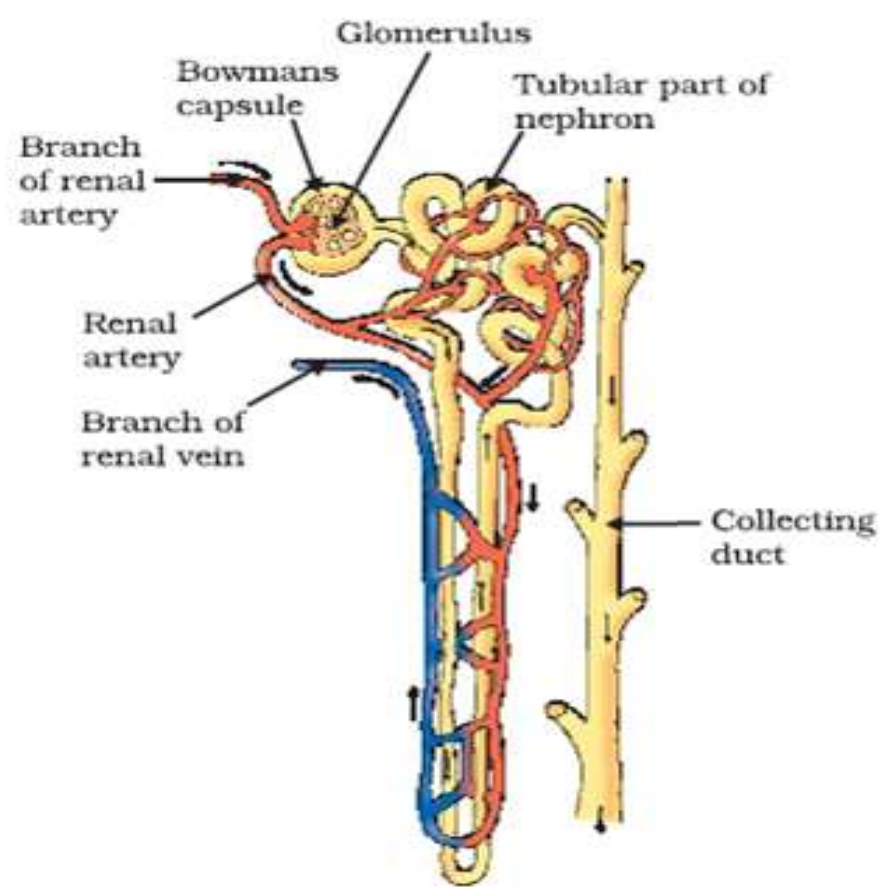
# PANCREAS



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CRACK[+]OSPI+AL

- Pancreas is **ExoCrine** (with Digestive Enzymes).
- Pancreas is **ALSO EndoCrine** (with Hormones).
- Islets of Langerhans: **Glucagon** makes sugar from glycogen, or lactic acid, or amino acids. **Insulin** takes sugar from blood into cells. If the pancreas cannot provide enough insulin, **Diabetes mellitus** results. **Type 1**: No insulin = insulin injections needed. **Type 2**: Makes some insulin = medication and awareness of diet.

# OSMO- REGULATION



- **Aldosterone** from Adrenal Gland adds Sodium to the Sodium Pump around Loop of Henle.
- **AntiDiuretic Hormone** from HypoThalamus to posterior Pituitary opens pores of distal convoluted tubule to allow more water out, so that more water can enter the blood. This is released when your body needs to keep water in it (like when you've done lots of exercise).



# METABOLIC RATE



- Metabolic Rate is how quickly and efficiently you break down your food. It affects your use of Oxygen, and **how** you grow and develop.
- Is controlled by Thyroxin (from Thyroid Gland).
- Too little Iodine → Goitre = Enlarged Thyroid.
- Too much Thyroxin = **Hyper**Thyroidism. Loss of Weight. Pop-out eyes. Quicker heartbeat. Less sleep. HyperActive.
- Too little Thyroxin = **Hypo**Thyroidism. Results in bad conditions: lots of fluids, bad skin, etc.

# ADRENALIN



- Called the FIGHT-or-FLIGHT hormone, because it gives your body a **boost of energy** in a crisis:
  1. Quicker heartbeat = higher blood pressure (transport).
  2. Quicker, heavier breathing – Oxygen in, Carbon dioxide out.
  3. Stored glycogen is made into glucose (sugar) - energy.
  4. Blood goes to muscles, not skin or intestines.
  5. Cell metabolic activities operate quicker.
  6. Muscles are now primed for action.